

# Anthocyanin production process from callus cultures of *Aristotelia Chilensis*

## DESCRIPTION

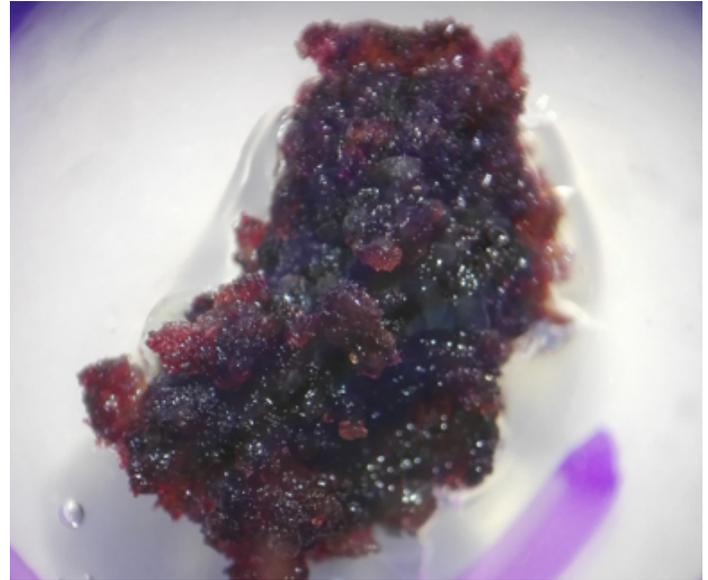
The in vitro anthocyanin production process was designed to supply the current world demand for these natural products with high bioactivity. The conventional production of maqui anthocyanins (*Aristotelia chilensis*) is carried out by manual harvesting of the fruit and its subsequent extraction. This is a new technology that is not limited by the seasonality of the fruit, allowing anthocyanins to be obtained at all times of the year, since it is based on the in vitro callus biomass management of the species, in this system this biomass is amplified and then transformed into anthocyanins. Obtaining the same anthocyanins present in the fruit, and preserving its molecular properties.

The differentiating attributes of our product are:

1. It is a natural product has no environmental impact
2. Production is not affected by seasonality.
3. The production system is predictable and the standardization of the final product is homogeneous.
4. The bioactive compounds present have been validated in different experimental models in health and nutrition.

## TECHNOLOGY

The production process is based on obtaining anthocyanins from calluses of the *Aristotelia chilensis* species under controlled cultivation conditions. The process is divided into three stages, in the first the calluses are cultivated in specific conditions of the substrate to obtain a large quantity of callus biomass in the bioreactor system, and later in a second stage, to elicit these calluses to produce anthocyanins and finally in the third to transform this mass, rich in bioactive compounds into a powder format. The process currently allows us to obtain up to 40% of the anthocyanins contained in the fruit with a high antioxidant capacity which allows it to be used in various types of products based on natural compounds.



▲ The production process is based on obtaining anthocyanins from calluses of the species *Aristotelia chilensis*

## MARKET

Anthocyanin extract is a widely demanded natural dye and is mainly used for the manufacture of products in the food and pharmaceutical industries. The global anthocyanin market reached \$ 400 million in 2018 and is expected to grow to \$ 590 million by the end of 2025. According to the report "Global Anthocyanins Market Report, History and Forecast 2014-2025, Breakdown Data by Manufacturers, Key Regions, Types and Application", the annual growth rate will be 5.0% between 2019 and 2025.

Anthocyanins are used in different industries, such as natural dyes, nutraceuticals and cosmetics. The global market for natural dyes reached US \$ 1.3 billion in 2016 and an increase of 7.8% is expected for the period 2016-2023 according to the report of "Natural Food Colors Market Global Demand Growth Analysis Opportunity Outlook 2023".

## ADVANTAGES

1. Natural product has no environmental impact
2. Production is not affected by seasonality.
3. The production system is predictable and the standardization of the final product is homogeneous.
4. The bioactive compounds present have been validated in different experimental models in health and nutrition.

## APPLICATIONS

- Areas of action:
  - Cosmetics reduces oxidative stress on the skin
  - Food supplement with nutraceutical action
  - Natural food coloring
- Cellular activities:
  - Natural antioxidant
  - Anti-inflammatory
  - Anticancer
  - Neuroprotective
  - Hypocholesterolemic
  - Hypotensive

## INVENTORS



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## OPPORTUNITY

Anthocyanin extract is a natural dye that is used for the production of products in the food and pharmaceutical industries, it is currently subject to environmental conditions and picker handling, which affects production levels and fruit quality especially of its bioactive compounds. So it becomes necessary to develop an anthocyanin production method that allows obtaining a quality product, in quantity according to demand and that does not compete with the maqui fruit intended for consumption.

The process of obtaining anthocyanins from callus cultures of *Aristotelia chilensis*, allows decoupling the supply from the seasonality of the fruit, thus being able to complete the current demand for these bioactive compounds. In addition, the process when carried out under controlled conditions allows obtaining a standardized product in quality and concentration of active compound. On the other hand, anthocyanins are rich in phenolic groups that have a high antioxidant capacity, which are beneficial for health, acting as anti-inflammatory, anti-cancer, antibacterial and neuroprotective, among others.

## INTELLECTUAL PROPERTY

- Invention patent application PCT - CL2019-050150. Universidad Mayor and Fundación Copec UC.

## TECHNOLOGY DEVELOPMENT STATUS

TRL 3: The concept and processes have been demonstrated on a laboratory or at benchtop scale.

## FOR MORE INFORMATION

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